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(54) **TRANSFER MECHANISM FOR ENVIRONMENTAL TESTING APPARATUS**

TRANSFERMECHANISMUS FÜR EINE UMWELTPRÜFVORRICHTUNG

MECANISME DE TRANSFERT POUR APPAREIL D'ESSAI ENVIRONNEMENTAL

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Description

Field of Invention

[0001] This invention relates generally to environmentally-controlled testing equipment for testing devices and, in particular, to environmental test apparatus of the type having plural environmentally-controlled testing chambers in which devices are tested in sequential fashion.

Background of the Invention

[0002] Many types of devices or products undergo testing to improve their quality and reliability. Typically, these types of devices or products undergo a series of environmental tests under various combinations of temperature, humidity, and other climatic conditions to insure product reliability and performance in extreme environmental conditions. Further, many of these devices are tested to insure that they are not adversely effected when operated in a common environment with a plurality of other such devices.

[0003] In order to test their devices, manufacturers often utilize an environmental test apparatus which is capable of producing rapid and extreme changes in temperature, humidity and other climatic conditions. A prominent designer and manufacturer of such environmental test apparatus is Thermotron Industries, Inc. of Holland, Michigan.

[0004] These types of tests are often conducted with a single testing chamber. The climatic conditions within the testing chamber are controlled by heating, humidity and air conditioning units which generate the rapid changes in climatic conditions within such testing chamber. Alternatively, first and second testing chambers may be provided. In such apparatus, the environments within the testing chambers are independently controlled by separate heating, humidity and air conditioning units, and a basket carries the devices to be tested between the testing chambers. An insulation space is provided between the testing chambers in order to limit the transfer of heat therebetween.

[0005] Heretofore, the basket has been mounted within a basket frame. The basket is centrally located within the frame so as to provide air gaps on opposite sides of the basket of lengths generally equal to the thickness of the insulation space provided between the testing chambers. The air gaps are necessary to act as an insulation space between the basket located in one of the testing chambers and the other testing chamber. As such, the height of the product-carrying cavity in the prior art basket is equal to the height of the basket frame minus twice the thickness of the insulation space provided between the testing chambers. The limitations on the size of the product-carrying cavity in the basket reduces the volume available in the basket to hold product during testing. Consequently, by limiting the volume available for product, the number of products which may be tested at a single time with environmental test apparatus is correspondingly limited. Alternatively, if greater volume within the basket is not necessary, the size of the environmental test apparatus must still accommodate the basket and the air gaps.

Objects of the Invention

[0006] Therefore, it is a primary object and feature of the present invention to provide improved plural-chamber environmentally-controlled test apparatus overcoming problems and shortcomings of the prior art.

[0007] Another object of this invention is to provide plural-chamber environmentally-controlled test apparatus with an improved transfer mechanism.

[0008] Another object of this invention is to provide plural-chamber environmentally-controlled test apparatus incorporating a transfer basket of a greater volume than in prior art devices.

[0009] Yet another object of the invention to provide a transfer mechanism for a plural-chamber environmental test apparatus which environmentally isolates one testing chamber from another.

[0010] Another object of the invention to provide an environmental test apparatus transfer mechanism which is simple to operate and inexpensive to manufacture.

Summary of the Invention

[0011] In accordance with the present invention, an improved apparatus as defined by claim 1 is provided for conducting environmental tests on devices.

[0012] The apparatus includes a cabinet defining first and second testing chambers therein. An isolation wall extends between the testing chamber and has an opening therein so as to allow passage between the first and second testing chambers. A sealing structure is positioned within the cabinet and includes first and second sealing members interconnected by a support element. The sealing structure is movable between a first position wherein the first sealing member engages the first side of the insulation wall and overlaps the opening therein and a second position wherein the second sealing member engages the second side of the insulation wall and overlaps the opening therein.

[0013] A basket is provided for carrying the device to be tested. The basket is movable along the support element of the sealing structure between a first position adjacent the first sealing member and a second position adjacent the second sealing member. An actuator extends through one of the sealing members and is interconnected to the basket. The actuator controls movement of the basket between the first and second positions. A control structure may be operatively connected to the cabinet for independently controlling environmental conditions within the testing chamber.

[0014] The first sealing member includes a generally flat plate having a seal affixed thereto. The seal of the

first sealing member engages the first side of the insulation wall with the sealing structure in the first position. The second sealing member includes a generally flat plate having a seal affixed thereto. The seal of the second sealing member engages the second side of the insulation wall with the sealing structure in the second position.

[0015] The support element of the sealing structure includes a shaft extending between the first and second sealing members. The basket includes a guide therethrough. The shaft of the support structure extends through the guide in order to guide the basket between the first and second positions.

[0016] The basket is slidable along the at least one support of the frame structure between the first position adjacent the first sealing panel and a second position adjacent the second sealing panel. The basket may include a guide tube having a passageway therethrough. The shaft of the support structure extends through the passageway and the guide tube so as to guide the basket between the first and the second positions. An actuator extends through one of the sealing members and is interconnected to the basket. The actuator controls movement of the basket between first and second positions.

[0017] The first sealing panel of the frame structure includes the seal affixed thereto. The seal of the first sealing panel engages the first panel of the insulation wall with the frame structure in the first position. The second sealing panel of the frame structure also includes a seal affixed thereto. The seal of the second sealing panel engaging the second panel of the insulation wall with the frame structure in the second position.

[0018] The basket is slidable along the at least one support of the frame structure between a first position adjacent the first sealing panel and a second position adjacent the second sealing panel.

[0019] It is contemplated that the frame structure be movable between a first position wherein the first sealing panel engages a first side of the insulation wall and overlaps an opening therein, and a second position in the second sealing panel engages the second side of the insulation wall and overlaps the opening therein. The first sealing panel includes a seal affixed thereto. The seal of the first sealing panel engages the first side of the insulation wall with the frame structure in the first position. The second sealing panel also includes a seal affixed thereto. The seal of the second sealing panel engaging the second side of the insulation wall with the frame structure in the second position.

[0020] The basket includes a guide therethrough. The support of the frame structure extends through the guide and guides the basket between the first and second positions. An actuator extends through one of the sealing panels and is interconnected to the basket. The actuator controls movement of the basket between the first and second positions.

Brief Description of the Drawings

[0021] The drawings furnished herewith illustrate a preferred construction of the present invention in which the above advantages and features are clearly disclosed as well as others which will be readily understood from the following description of the illustrated embodiment.

FIGURE 1 is an isometric view of an environmental test apparatus for receiving a transfer mechanism in accordance with the present invention.

FIGURE 2 is an isometric view of a prior art transfer mechanism.

FIGURE 3 is a front elevational view, partially in section, showing the prior art transfer mechanism of FIGURE 2 in a raised position within an environmental test apparatus.

FIGURE 4 is a front elevational view, partially in section, showing the prior art transfer mechanism of FIGURE 2 in an intermediate position within an environmental test apparatus.

FIGURE 5 is a front elevational view, partially in section, showing the prior art transfer mechanism in a lowered position within an environmental test apparatus.

FIGURE 6 is an isometric view of a transfer mechanism in accordance with the present invention.

FIGURE 7 is a front elevational view, partially in section, showing the transfer mechanism of the present invention in a raised position within the environmental test apparatus of FIGURE 1.

FIGURE 8 is a front elevational view, partially in section showing the transfer mechanism of the present invention in an intermediate position within the environmental test apparatus of FIGURE 1.

FIGURE 9 is a front elevational view, partially in section, showing the transfer mechanism of the present invention in a lowered position within the environmental test apparatus of FIGURE 1.

Detailed Description of the Drawings

[0022] Referring to FIGURE 1, an environmental test apparatus is generally designated by the reference numeral 10. Environmental test apparatus 10 includes a body portion 12 defined by sidewalls 14 and 16, FIGURES 3-5 and 7-9, upper and lower walls 18 and 20, respectively, and rear wall (not shown). A generally horizontal insulation wall 24 is disposed between and upper and lower walls 18 and 20, respectively, and between sidewalls 14 and 16. Insulation wall 24 includes an opening 26 therein for reasons hereinafter described.

[0023] As best seen in FIGURES 3-5 and 7-9, sidewall 14 is defined by an inner panel 28 and an outer panel 30 having insulation disposed therebetween. Similarly, sidewall 16 is defined by an inner panel 29 and an outer panel 31 having insulation disposed therebetween.

[0024] Lower wall 20 of body portion 12 in environmen-

tal test apparatus 10 is defined by an inner panel 32 and an outer panel 34 having insulation disposed therebetween. It is contemplated to position outer panel 34 of lower wall 20 on a supporting base 36, FIGURE 1, so as to support body portion 12 of environmental test apparatus 10 above a supporting surface, such as a floor of a laboratory or the like.

[0025] As is conventional, rear wall (not shown) in environmental test apparatus 10 is defined by an inner panel and an outer panel having insulation disposed therebetween. Body portion 12 further includes upper wall 18 projecting forwardly from rear wall. Upper wall 18 is defined by an inner panel 38 and an outer panel 40 having insulation disposed therebetween. One or more access ports 27 may extend through upper wall 18 in order to allow an actuator, as hereinafter described, to pass therethrough and/or to allow an operator to insert wiring, cabling or the like into environmental test apparatus 10.

[0026] Insulation wall 24 includes an upper panel 42 and a lower panel 44 having insulation disposed therebetween. A vertical wall 45 extends between upper panel 42 and lower panel 44 so as to define opening 26 in insulation wall 24. Upper panel 42 of insulation wall 24 and inner panel 38 of upper wall 18 define a first upper testing chamber 48 in environmental test apparatus 10. Lower panel 44 of insulation wall 24 and inner panel 32 of lower wall 20 define a second, lower testing chamber 50 within environmental test apparatus 10. As is conventional, the height H_1 of upper testing chamber 48 is generally equally to the height H_1 of lower testing chamber 50.

[0027] Referring back to FIGURE 1, a controller housing 52 is mounted to and abuts outer panel 31 of sidewall 16. Controller housing 52 houses the controller (not shown) for the environmental conditioning units such as heaters, air conditioning units, and the like stored in supporting base 36. As is conventional, the heaters and air conditioning units in supporting base 36 independently vary the environmental conditions within upper testing chamber 48 and lower testing chamber 50 in response to commands from the controller.

[0028] Controller housing 52 includes a forwardly directed face 54 having a plurality of user interface devices mounted thereto. By way of example, such user interface devices may include a keypad 56 and function switches, collectively designated by the reference numeral 58. Keypad 56 and function switches 58 are interconnected to the controller (not shown) in order to allow an operator to reset the climatic conditions within upper testing chamber 48 and lower testing chamber 50 within body portion 12 during testing. A plurality of analog gauges and/or dials 60a-60d are mounted to forwardly directed face 54 of controller housing 52. Dials 60a-60d may be interconnected to sensors (not shown) which measure pressures within the various climatic conditioning units in the body portion 12. It is contemplated to interconnect the controller, heaters, air conditioning units and other climatic conditioning units to a power source (not shown).

[0029] Environmental test apparatus 10 further includes a door 62 having an inner panel 64 and an outer panel having insulation disposed therebetween. Door 62 is pivotably mounted to outer panel 30 of sidewall 14 of body portion 12 by hinges so as to allow door 62 to pivot thereon between a closed position and an open position, FIGURE 1. As is conventional, a conductive gasket 66 may be mounted to inner panel 64 of door 62 about the outer periphery thereof. With door 62 in a closed position, conductive gasket 66 abuts outwardly directed face plate 68 of body portion 12 so as to form a seal between door 62 and body portion 12 thereby isolating the environments within testing chambers 48 and 50 from the environment outside environmental test apparatus 10.

[0030] In order to transfer a product between upper testing chamber 48 and lower testing chamber 50, a transfer mechanism must be used. Referring to FIGURES 2-5, a prior art transfer mechanism is generally designated by the reference numeral 70. Prior art transfer mechanism 70 includes a frame structure 72 formed from generally rectangular upper and lower sealing panels 74 and 76, respectively. Upper and lower sealing panels 74 and 76, respectively, are generally parallel to each other and spaced from each other by a plurality of vertical supports 78. The length of supports 78 are generally equal to the height H_1 of one of the testing chambers 48 or 50 plus the height HW_1 of vertical wall 45 of insulation wall 24.

[0031] Upper sealing panel 74 of frame structure 72 includes an upper surface 80 and a lower surface 82. A seal 84 is mounted to lower surface 82 of upper sealing panel 74 radially outwardly of supports 78. Lower sealing panel 76 includes a lower surface 86 and an upper surface 88. A seal 90 is mounted to upper surface 88 of lower sealing panel 76 radially outwardly of supports 78.

[0032] A basket 92 is mounted within frame structure 72. Basket 92 includes an upper basket panel 94 and a lower basket panel 96 which defines a product receiving cavity 98 therebetween for receiving the products to be tested within environmental test apparatus 10. Basket 92 is centrally located between upper sealing panel 74 and lower sealing panel 76 of frame structure 72 such that an upper air gap 100 is provided between upper basket panel 94 and upper sealing panel 74 and a lower air gap 102 is provided between lower basket panel 96 and lower sealing panel 76. The widths of air gaps 100 and 102 are generally equal to the height HW_1 of vertical wall 45 of insulation wall 24.

[0033] Referring to FIGURE 3, in operation, transfer mechanism 70 is positioned within environmental test apparatus 10 such that upper sealing panel 74 is received within upper testing chamber 48 and lower sealing panel 76 is received within lower testing chamber 50. Transfer mechanism 70 is movable between a first raised position, FIGURE 3, wherein basket 92 is fully received within upper testing chamber 48 and a second, lowered position, FIGURE 5, wherein basket 92 is fully received within lower testing chamber 50. An actuator 104 extends through access port 27 and is interconnected to upper sealing

panel 74 to effectuate movement of transfer mechanism 70 between the raised position, FIGURE 3, and the lowered position, FIGURE 5. Actuator 104 may take the form of an air cylinder, a hydraulic cylinder, a linear screw actuator or other similar mechanism.

[0034] In the raised position, FIGURE 3, lower sealing panel 76 overlaps opening 26 in insulation wall 24 such that seal 90 engages the lower panel 44 of insulation wall 24 so as to isolate the environment in upper testing chamber 48 from the environment in lower testing chamber 50. Air gap 102 provides an insulation space to further isolate the products within product receipt cavity 98 of basket 92 from the environment within lower testing chamber 50.

[0035] As transfer mechanism 70 is lowered, FIGURE 4, from the raised position, FIGURE 3, to the lowered position, FIGURE 5, seal 90 disengages from the lower panel 44 of insulation wall 24. In the lowered position, FIGURE 5, upper sealing panel 74 overlaps opening 26 in insulation wall 24 such that seal 84 engages upper panel 42 of insulation wall 24 so as to isolate lower testing chamber 50 from the environment in upper testing chamber 48. Air gap 100 acts to further insulate the products to be tested within product receipt cavity 98 in basket 92 from the environment in upper testing chamber 48.

[0036] As described, in order to accommodate air gaps 100 and 102 in transfer mechanism 70, the height H of product receiving cavity 98 in basket 92 is limited to being no greater than the lengths of the supports 78 of frame structure 72 minus the widths of both air gaps 100 and 102. This, in turn, limits the number of products which may be inserted into product receipt cavity 98 and, hence, the number of products which may be tested at any one time.

[0037] In order to overcome the limitations on the height H of product receipt cavity 98 in prior art basket 92, a transfer mechanism 110 in accordance with the present invention is provided. As best seen in FIGURES 6-9, transfer mechanism 110 includes a frame structure 112 formed from generally rectangular upper and lower sealing panels 114 and 116, respectively. Upper and lower sealing panels 114 and 116, respectively, are generally parallel to each other and spaced from each other by a plurality of vertical supports 118. The length of supports 118 are generally equal to the height H_1 of one of the testing chambers 48 or 50 plus the height HW_1 of vertical wall 45 of insulation wall 24.

[0038] Upper sealing panel 114 of frame structure 112 includes an upper surface 120 and a lower surface 122. A seal 124 is mounted to lower surface 122 of upper sealing panel 114 radially outwardly of supports 118. Lower sealing panel 116 also includes a lower surface 126 and an upper surface 128. A seal 130 is mounted to upper surface 128 of lower sealing panel 116 radially outwardly of supports 118.

[0039] A basket 132 is slidably mounted within frame structure 112. Basket 132 is generally box-shaped and includes an upper basket panel 134 and a lower basket panel 136 which defines a product receiving cavity 138 therebetween for receiving the products to be tested within environmental test apparatus 10. Upper basket panel 134 and lower basket panel 136 are interconnected by guides 140, 141 and 142. Guides 140, 141 and 142 include corresponding passageways 140a, 141a and 142a, respectively, therethrough. Supports 118 extend through corresponding passageways 140a, 141a and 142a in guides 140, 141 and 142, respectively, such that basket 132 is allowed to slide along supports 118 between a first raised position, FIGURE 7, and a second lowered position, FIGURE 9.

[0040] Referring to FIGURES 7-9, in operation, transfer mechanism 110 is positioned within environmental test apparatus 10 such that upper sealing panel 114 is received within upper testing chamber 48 and lower sealing panel 116 is received within lower testing chamber 50. Transfer mechanism 110 is movable between a first position of FIGURE 7, wherein basket 132 is fully received within upper testing chamber 48 and a second, lowered position, FIGURE 9, wherein basket 132 is fully received within lower testing chamber 50. Actuator 104 extends through access port 27 and through upper sealing panel 114, and is interconnected to upper basket panel 134 to effectuate movement of transfer mechanism 110 between the raised position, FIGURE 7, and the lowered position, FIGURE 9. As heretofore described, actuator 104 may take the form of an air cylinder, a hydraulic cylinder, a linear screw actuator or other similar mechanism. It is contemplated to bundle cable, wiring or the like with actuator 104 so as to electrically connect the product to be tested to various testing equipment and to allow such cabling, wiring or the like to travel with actuator 104.

[0041] In the raised position, FIGURE 7, lower sealing panel 116 overlaps opening 26 in insulation wall 24 such that seal 130 engages the lower panel 44 of insulation wall 24 so as to isolate the environment in upper testing chamber 48 from the environment in lower testing chamber 50. In addition, upper basket panel 134 abuts lower surface 122 of upper sealing panel 114 and upper sealing panel 114 abuts inner panel 38 of upper wall 18 of body portion 12 of environmental test apparatus 10. An air gap 148 is defined between lower basket panel 136 and upper surface 128 of lower sealing panel 116 in order to provide the necessary insulation space to further isolate the product within product receipt cavity 138 of basket 132 from the environment within lower testing chamber 50.

[0042] As transfer mechanism 110 is lowered, FIGURE 8, from the raised position, FIGURE 7, to the lowered position, FIGURE 9, seal 130 disengages from the lower panel 44 of insulation wall 24. Further, basket 132 is slidably guided along supports 118 towards lower sealing panel 116 upon the engagement of lower surface 126 of lower sealing panel 116 with inner panel 32 of lower wall 20. In the lowered position, FIGURE 9, upper sealing panel 114 overlaps opening 26 in insulation wall 24 such that seal 124 engages upper panel 42 of insulation wall

24 so as to isolate the environment in lower testing chamber 50 from the environment in upper testing chamber 48. In addition, lower basket panel 136 abuts upper surface 128 of lower sealing panel 116 and lower sealing panel 116 abuts inner panel 32 of lower wall 20 of body portion 12 of environmental test apparatus 10. An air gap 150 is defined between upper basket panel 134 and lower surface 122 of upper sealing panel 114 in order to provide the necessary insulation space to further isolate the product within product receipt cavity 138 of basket 132 from the environment within upper testing chamber 48.

[0043] As described, the height H_2 of product receipt cavity 138 of basket 132 exceeds the height H of the product receipt cavity 98 in prior art basket 92 by the height HW_1 of vertical wall 45. Hence, the volume of product receipt cavity 138 in basket 132 is greater than in prior baskets. As a result, transfer mechanism 110 allows for additional product to be simultaneously tested within environmental test apparatus as compared to prior such transfer mechanisms.

[0044] Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

Claims

1. Apparatus for conducting environmental tests on a device, comprising:

a cabinet (12) defining first and second testing chambers (48,50) therein;
an insulation wall (24) extending between the testing chambers (48,50) and having an opening (26) therein so as to allow passage between the first and second testing chambers (48,50);
a sealing structure (110) positioned within the cabinet (12) and including first and second sealing members (114,116) interconnected by a support structure (118), the sealing structure (110) movable between a first position wherein the first sealing member (114) engages a first side of the insulation wall (24) and overlaps the opening (26) therein and a second position wherein the second sealing member (116) engages a second side of the insulation wall (24) and overlaps the opening (26) therein; and
a basket (132) for carrying the device to be tested, the basket (132) movable along the support structure (118) of the sealing structure (110) between a first position in which the first sealing member (114) engages the first side (42) of the insulation wall (24) to isolate the first testing chamber (48) and the basket (132) therein from the second testing chamber (50) and a second position in which the second sealing member (116) engages the second side (44) of the insulation wall (24) to isolate the first testing chamber (48) from the second testing chamber (50) and the basket (132) therein.

2. The apparatus of claim 1 wherein the support structure (118) includes at least one shaft extending between the first and second sealing members (114,116).

3. The apparatus of claim 2 wherein the basket (132) includes a guide (140-142) therethrough, the at least one shaft of the support structure (118) extending through the guide (140-142) in order to guide the basket (132) between the first and second positions.

4. The apparatus of one of the preceding claims wherein
the insulation wall (24) including first and second spaced panels (42,44) interconnected by a third panel (45) of predetermined length (HW_1) and being perpendicular to the first and second panels (42,44) so as to define the opening (26) in the insulation wall (24);
a frame structure (112) positioned within the cabinet (12) and including first and second sealing panels (114,116) interconnected by at least one support (118) having a predetermined length, the frame structure (112) movable between a first position wherein the first sealing panel (114) engages the first panel (42) of the insulation wall (24) and overlaps the opening (26) therein and a second position wherein the second sealing panel (116) engages the second panel (44) of the insulation wall (24) and overlaps the opening (26) therein; and
the basket (132) being supported by the frame structure (112) and having a length, depth and height which is generally equal to the difference between the length of the at least one support (118) of the frame structure (112) and the length (HW_1) of the third panel (45) of the insulation wall (24).

5. The apparatus of one of the preceding claims further comprising a control structure (within 52) operatively connected to the cabinet (12) for independently controlling the environmental conditions within each testing chamber (48,50).

6. The apparatus of one of the preceding claims wherein the basket (132) is slidable along the at least one support (118) of the frame structure (112) between a first position adjacent the first sealing panel (114) and a second position adjacent the second sealing panel (116).

7. The apparatus of claim 6 wherein the basket (132) includes a guide (140-142) therethrough, the at least one support (118) extending through the guide (140-142) in order to guide the basket (132) between

said first and second positions.

8. The apparatus of claim 4 wherein the frame structure (112) movable between a first position wherein the first sealing panel (114) engages a first side (42) of the insulation wall (24) and overlaps the opening (26) therein and a second position wherein the second sealing panel (116) engages a second side (44) of the insulation wall (24) and overlaps the opening (26) therein.

9. The apparatus of claim 8 wherein the first sealing member or panel (114) includes a seal (124) affixed thereto, the seal (124) of the first sealing member or panel (114) engaging the first side or panel (42) of the insulation wall (24) with the frame structure (112) in the first position.

10. The apparatus of claim 9 wherein the second sealing member or panel (116) includes a seal (130) affixed thereto, the seal (130) of the second sealing member or panel (116) engaging the second side or panel (44) of the insulation wall (24) with the frame structure (112) in the second position.

11. The apparatus of one of the preceding claims further comprising an actuator (104) extending through one (114) of the sealing members or panels (114,116) and being interconnected to the basket (132), the actuator (104) controlling movement of the basket (132) between said first and second positions.

Patentansprüche

1. Vorrichtung zur Durchführung von Umweltprüfungen an einem Gerät mit:

einem Gehäuse (12), das erste und zweite Testkammern (48, 50) darin definiert;
einer Isolierwand (24), die sich zwischen den Testkammern (48, 50) erstreckt und darin eine Öffnung (26) aufweist, um einen Durchgang zwischen den ersten und zweiten Testkammern (48, 50) zu ermöglichen;
einem Dichtungsaufbau (110), der innerhalb des Gehäuses (12) angeordnet ist und erste und zweite Dichtelemente (114, 116) umfasst, die durch eine Tragstruktur (118) miteinander verbunden sind, wobei der Dichtungsaufbau (110) zwischen einer ersten Position, wobei das erste Dichtelement (114) mit einer ersten Seite der Isolierwand (24) ineinandergreift und die Öffnung (26) darin überlappt, und einer zweiten Position bewegbar ist, wobei das zweite Dichtelement (116) mit einer zweiten Seite der Isolierwand (24) ineinandergreift und die Öffnung (26) darin überlappt; und
einem Korb (132) zum Tragen bzw. Stützen des zu prüfenden Gerätes, wobei der Korb (132) entlang der Tragstruktur (118) des Dichtungsaufbaus (110) zwischen einer ersten Position, in der das erste Dichtungselement (114) mit der ersten Seite (42) der Isolierwand (24) ineinandergreift, um die erste Testkammer (48) und den Korb (132) darin von der zweiten Testkammer (50) zu isolieren, und einer zweiten Position bewegbar ist, in der das zweite Dichtungselement (116) mit der zweiten Seite (44) der Isolierwand (24) ineinandergreift, um die erste Testkammer (48) von der zweiten Testkammer (50) und dem Korb (132) darin zu isolieren.

2. Vorrichtung nach Anspruch 1, wobei die Tragstruktur (118) mindestens einen Schaft aufweist, der sich zwischen den ersten und zweiten Dichtungselementen (114, 116) erstreckt.

3. Vorrichtung nach Anspruch 2, wobei der Korb (132) eine Führung (140-142) **dadurch** umfasst, wobei sich der mindestens eine Schaft der Tragstruktur (118) durch die Führung (140-142) erstreckt, um den Korb (132) zwischen der ersten und zweiten Position zu führen.

4. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei
die Isolierwand (24) erste und zweite beabstandete Platten (42, 44) umfasst, die durch eine dritte Platte (45) einer vorbestimmten Länge (HW_1) verbunden sind, wobei die dritte Platte (45) senkrecht zu den ersten und zweiten Platten (42, 44) ist, um die Öffnung (26) in der Isolierwand (24) zu definieren;
ein Rahmenaufbau (112), der innerhalb des Gehäuses (12) angeordnet ist und erste und zweite Dichtplatten (114, 116) umfasst, die durch mindestens einen Träger (118) miteinander verbunden sind, der eine vorbestimmte Länge aufweist, wobei der Rahmenaufbau (112) zwischen einer ersten Position, wobei die erste Dichtplatte (114) mit der ersten Platte (42) der Isolierwand (24) ineinandergreift und die Öffnung (26) überlappt, und einer zweiten Position beweglich ist, wobei die zweite Dichtplatte (116) mit der zweiten Platte (44) der Isolierwand (24) ineinandergreift und die Öffnung (26) überlappt; und
der Korb (132) durch den Rahmenaufbau (112) getragen ist und eine Länge, eine Tiefe und eine Höhe aufweist, die im Allgemeinen gleich der Differenz zwischen der Länge des mindestens einen Trägers (118) des Rahmenaufbaus (112) und der Länge (HW_1) der dritten Platte (45) der Isolierwand (24) ist.

5. Vorrichtung nach einem der vorhergehenden Ansprüche, die des Weiteren eine Steueranordnung (innerhalb 52) aufweist, die operativ mit dem Gehäuse (12) verbunden ist, um unabhängig die Umge-

bungsbedingungen innerhalb jeder Testkammer (48, 50) zu steuern.

6. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei der Korb (132) entlang des mindestens einen Trägers (118) des Rahmenaufbaus (112) zwischen einer ersten Position, die an die erste Dichtplatte (114) angrenzt, und einer zweiten Position verschiebbar ist, die an die zweite Dichtplatte (116) angrenzt.

7. Vorrichtung nach Anspruch 6, wobei der Korb (132) eine Führung (140-142) **dadurch** umfasst, wobei der mindestens eine Träger (118) sich durch die Führung (140-142) erstreckt, um den Korb (132) zwischen den ersten und zweiten Position zu führen.

8. Vorrichtung nach Anspruch 4, wobei der Rahmenaufbau (112) zwischen einer ersten Position, wobei die erste Dichtplatte (114) mit einer ersten Seite (42) der Isolierwand (42) ineinandergreift und die Öffnung (26) darin überlappt, und einer zweiten Position bewegbar ist, wobei die zweite Dichtplatte (116) mit einer zweiten Seite (44) der Isolierwand (24) ineinandergreift und die Öffnung (26) darin überlappt.

9. Vorrichtung nach Anspruch 8, wobei das erste Dichtelement oder die Platte (114) eine Dichtung (124) daran befestigt umfasst, wobei die Dichtung (124) des ersten Dichtungselements oder der Platte (114) mit der ersten Seite oder der Platte (42) der Isolierwand (24) ineinandergreift, wobei die Rahmenstruktur (112) sich in der ersten Position befindet.

10. Vorrichtung nach Anspruch 9, wobei das zweite Dichtelement oder die zweite Dichtplatte (116) eine Dichtung (130) daran befestigt umfasst, wobei die Dichtung (130) des zweiten Dichtelements oder der zweiten Dichtplatte (116) mit der zweiten Seite oder der zweiten Dichtplatte (44) der Isolierwand (24) ineinandergreift, wobei der Rahmenaufbau (112) sich in der zweiten Position befindet.

11. Vorrichtung nach einem der vorhergehenden Ansprüche, die des Weiteren ein Betätigungselement (104) aufweist, das sich durch eines (114) der Dichtelemente oder Platten (114, 116) erstreckt und mit dem Korb (132) verbunden ist, wobei das Betätigungselement (104) die Bewegung des Korbs (132) zwischen den ersten und zweiten Positionen steuert.

Revendications

1. Appareil pour réaliser des essais environnementaux sur un dispositif, comprenant :

une enceinte (12) définissant des première et seconde chambres d'essai (48, 50) dans celle-ci ;
une paroi d'isolation (24) s'étendant entre les chambres d'essai (48, 50) et ayant une ouverture (26) dans celle-ci de manière à permettre un passage entre les première et seconde chambres d'essai (48, 50) ;
une structure d'étanchéité (110) positionnée à l'intérieur de l'enceinte (12) et incluant des premier et second organes d'étanchéité (114, 116) mutuellement reliés par une structure de support (118), la structure d'étanchéité (110) étant mobile entre une première position dans laquelle le premier organe d'étanchéité (114) s'engage avec un premier côté de la paroi d'isolation (24) et recouvre l'ouverture (26) dans celle-ci, et une seconde position dans laquelle le second organe d'étanchéité (116) s'engage avec un second côté de la paroi d'isolation (24) et recouvre l'ouverture (26) dans celle-ci ; et
un panier (132) pour supporter le dispositif à soumettre à essai, le panier (132) étant mobile le long de la structure de support (118) de la structure d'étanchéité (110) entre une première position dans laquelle le premier organe d'étanchéité (114) s'engage avec le premier côté (42) de la paroi d'isolation (24) pour isoler la première chambre d'essai (48) et le panier (132) dans celle-ci par rapport à la seconde chambre d'essai (50), et une seconde position dans laquelle le second organe d'étanchéité (116) s'engage avec le second côté (44) de la paroi d'isolation (24) pour isoler la première chambre d'essai (48) de la seconde chambre d'essai (50) et du panier (132) dans celle-ci.

2. Appareil selon la revendication 1, dans lequel la structure de support (118) inclut au moins un arbre s'étendant entre les premier et second organes d'étanchéité (114, 116).

3. Appareil selon la revendication 2, dans lequel le panier (132) inclut un guide (140 - 142) à travers celui-ci, le au moins un arbre de la structure de support (118) s'étendant à travers le guide (140 - 142) afin de guider le panier (132) entre les première et seconde positions.

4. Appareil selon l'une des revendications précédentes, dans lequel
la paroi d'isolation (24) incluant des premier deuxième panneaux espacés (42, 44) mutuellement reliés par un troisième panneau (45) de longueur prédéterminée (HW_1) et étant perpendiculaire aux premier et deuxième panneaux (42, 44) de manière à définir l'ouverture (26) dans la paroi d'isolation (24) ;
une structure de châssis (112) positionnée à l'intérieur de l'enceinte (12) et incluant des premier et

second panneaux d'étanchéité (114, 116) mutuellement reliés par au moins un support (118) ayant une longueur prédéterminée, la structure de châssis (112) étant mobile entre une première position dans laquelle le premier panneau d'étanchéité (114) s'engage avec le premier panneau (42) de la paroi d'isolation (24) et recouvre l'ouverture (24) dans celle-ci, et une seconde position dans laquelle le second panneau d'étanchéité (116) s'engage avec le deuxième panneau (44) de la paroi d'isolation (24) et recouvre l'ouverture (26) dans celle-ci ; et
le panier (132) étant supporté par la structure de châssis (112) et ayant une longueur, une profondeur et une hauteur qui sont généralement égales à la différence entre la longueur du au moins un support (118) de la structure de châssis (112) et la longueur (HW_1) du troisième panneau (45) de la paroi d'isolation (24).

5. Appareil selon l'une des revendications précédentes, comprenant en outre une structure de commande (à l'intérieur de 52) reliée de manière opérationnelle à l'enceinte (12) pour commander indépendamment les conditions environnementales à l'intérieur de chaque chambre d'essai (48, 50).

6. Appareil selon l'une des revendications précédentes, dans lequel la panier (132) peut glisser le long du au moins un support (118) de la structure de châssis (112) entre une première position adjacente au premier panneau d'étanchéité (114) et une seconde position adjacente au second panneau d'étanchéité (116).

7. Appareil selon la revendication 6, dans lequel le panier (132) inclut un guide (140 - 142) à travers celui-ci, le au moins un support (118) s'étendant à travers le guide (140 - 142) afin de guider le panier (132) entre lesdites première et seconde positions.

8. Appareil selon la revendication 4, dans lequel la structure de châssis (112) est mobile entre une première position dans laquelle le premier panneau d'étanchéité (114) s'engage avec un premier côté (42) de la paroi d'isolation (24) et recouvre l'ouverture (26) dans celle-ci, et une seconde position dans laquelle le second panneau d'étanchéité (116) s'engage avec un second côté (44) de la paroi d'isolation (24) et recouvre l'ouverture (26) dans celle-ci.

9. Appareil selon la revendication 8, dans lequel le premier organe ou panneau d'étanchéité (114) inclut un joint (124) fixé à celui-ci, le joint (124) du premier organe ou panneau d'étanchéité (114) s'engageant avec le premier côté ou panneau (42) de la paroi d'isolation (24) avec la structure de châssis (112) dans la première position.

10. Appareil selon la revendication 9, dans lequel le second organe ou panneau d'étanchéité (116) inclut un joint (130) fixé à celui-ci, le joint (130) du second organe ou panneau d'étanchéité (116) s'engageant avec le second côté ou panneau (44) de la paroi d'isolation (24) avec la structure de châssis (112) dans la seconde position.

11. Appareil selon l'une des revendications précédentes, comprenant en outre un actionneur (104) s'étendant à travers l'un (114) des organes ou panneaux d'étanchéité (114, 116) et étant mutuellement relié au panier (132), l'actionneur (104) commandant un mouvement du panier (132) entre lesdites première et seconde positions.

FIG. 1

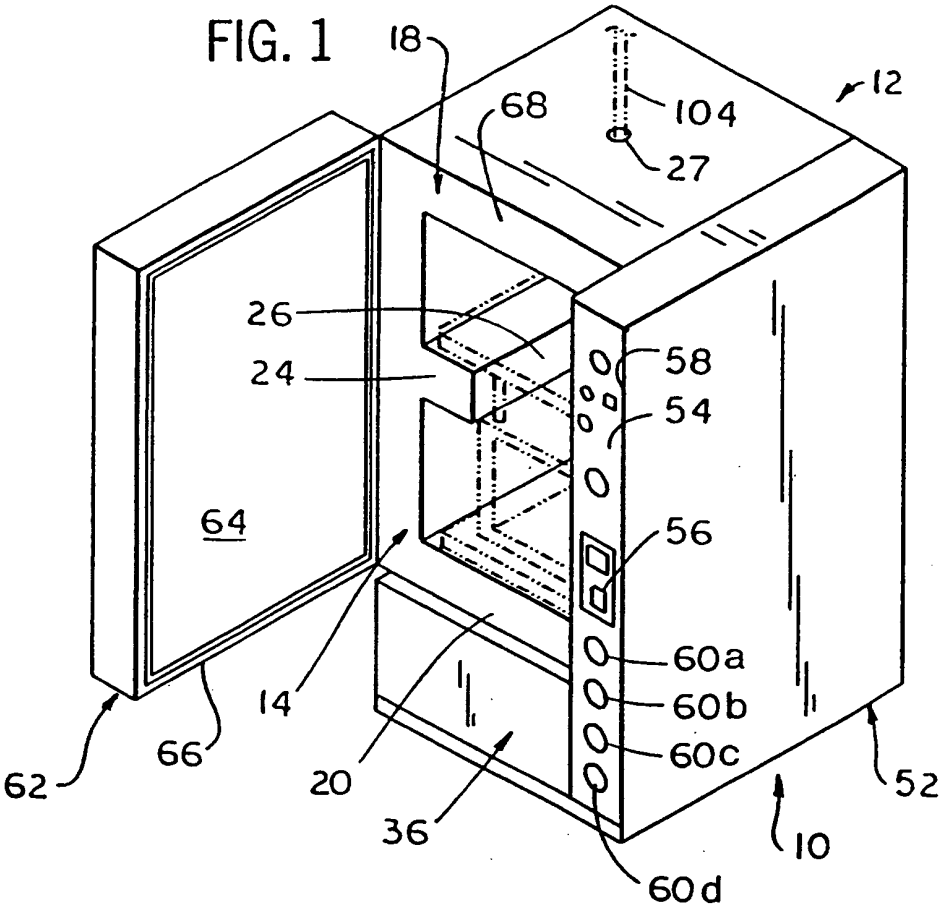


FIG. 2 PRIOR ART

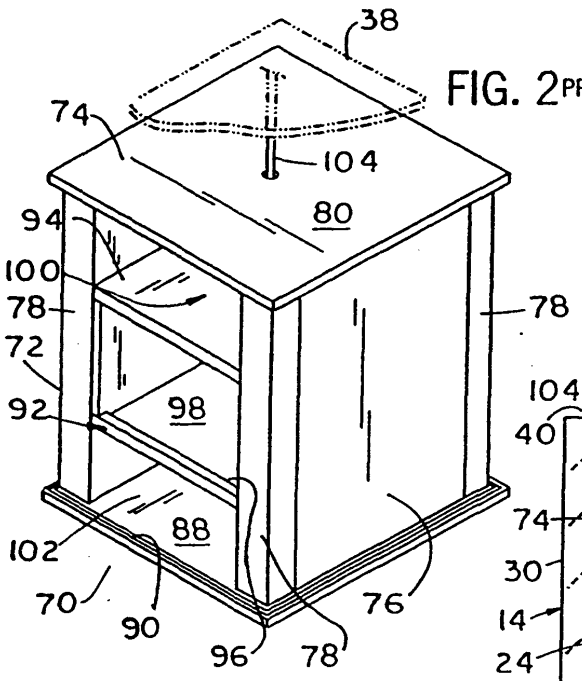


FIG. 3 PRIOR ART

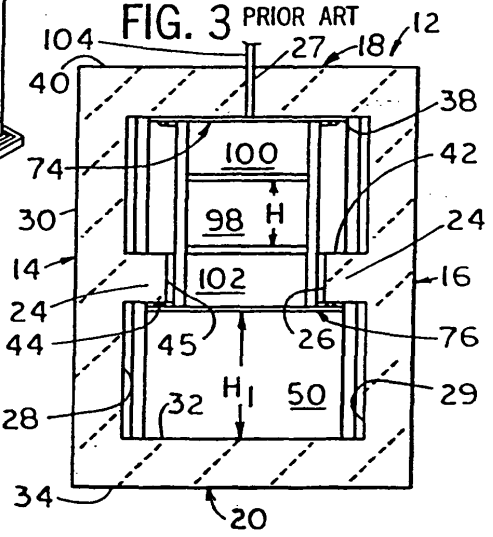


FIG. 4 PRIOR ART

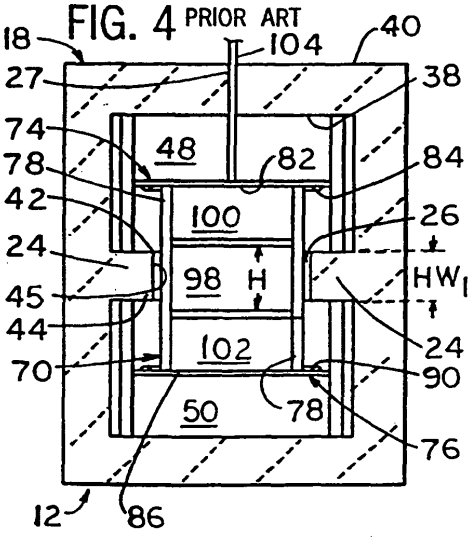
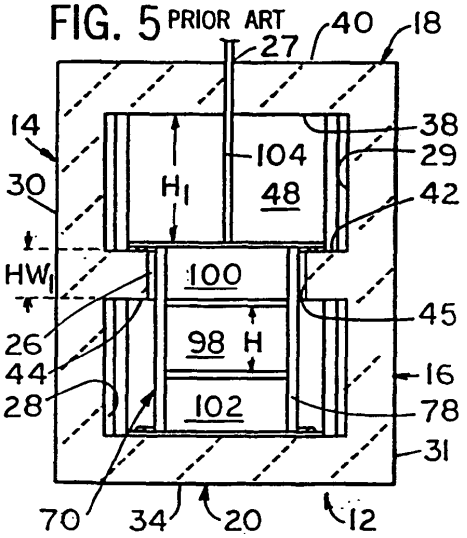


FIG. 5 PRIOR ART



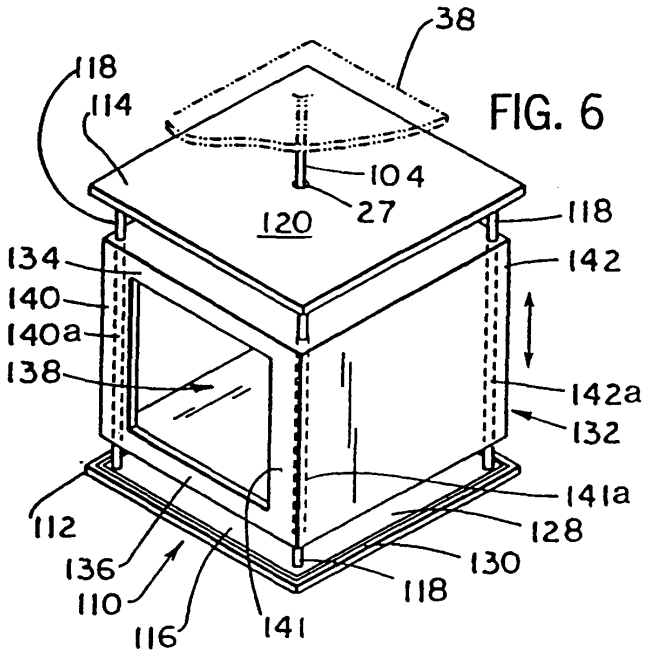

38
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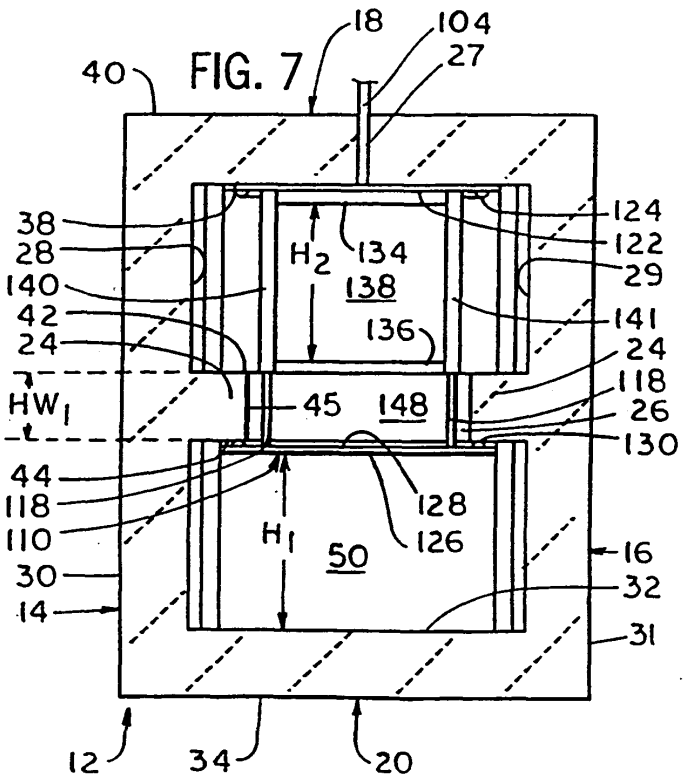
FIG. 6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HW_1
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148
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H_1
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FIG. 7

FIG. 8

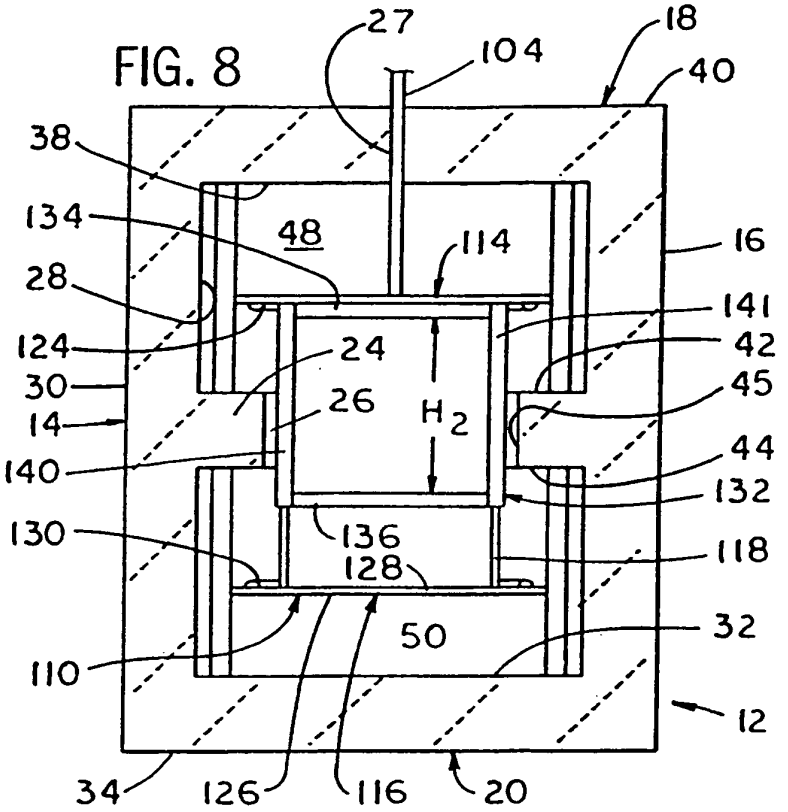
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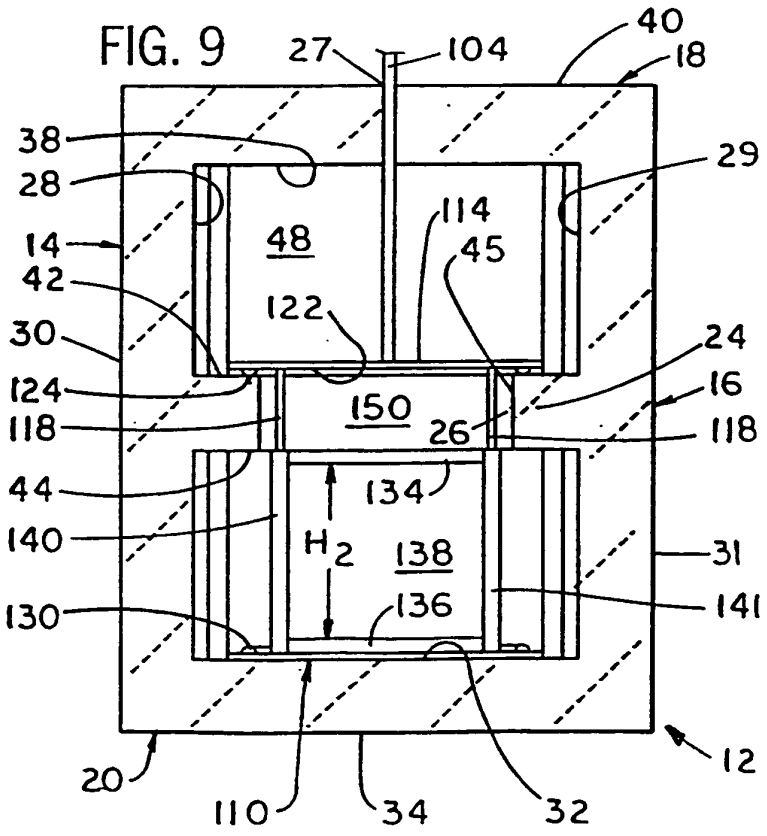
FIG. 9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